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ABSTRACT

A pilot study evaluation of SIGI (System of Interactive Guidance and Information) at Pasadena City College in 1974-75 tested the effectiveness of an experimental research design for an expanded field test of the system the following year. (SIGI is a computer based career guidance program designed by Educational Testing Service to assist community college students in improving their ability to make career decisions.) Students responding to newspaper articles and flyers about the system were assigned to experimental and control groups on a random basis (fifty in each). Basic data was collected from three questionnaires completed by students and one by counselors. Chi square was the statistical technique used to test the hypotheses of differences between the two groups on twenty-eight specific criteria. In addition to measures of suitability of career choices for students in the two groups, research questions included concern for the appeal of SIGI to males vs. females, to various age groups, to ethnic minorities, and to two-year occupational as opposed to academic majors. Effects of reading ability and program costs were also examined. Conclusions based on the pilot test were (1) that SIGI research design and methods are adequate for preliminary assessment of its effectiveness, (2) that techniques used to announce the purpose and availability of SIGI are reaching a representative segment of the student body; and (3) that students have a positive reaction to the SIGI experience. (Available separately are the research design--CE 015 037--and report of the expanded 1975-76 study--CE 015 035.) (JT)

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PASADENA CITY COLLEGE

SIGI PROJECT RESEARCH DESIGN

PILOT STUDY

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April 1976

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PASADENA CITY COLLEGE

SIGI PROJECT RESEARCH DESIGN

PILOT STUDY

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P I L O T S T U D Y

for the

PASADENA CITY COLLEGE RESEARCH DESIGN

SIGI PROJECT

March 1976

I. BACKGROUND

SIGI, a System of Interactive Guidance and Information, is the culmination of several years of research and development by a distinguished group of research scientists associated with the Educational Testing Service to assist students in making better career decisions. Pasadena City College is one of six community colleges, nationwide, which are now engaged in a field test of the SIGI program. The basic question is whether SIGI is more effective in helping students make better career decisions than the traditional vocational testing and counseling.

INTRODUCTION

The basic Research Design for the Pasadena City College SIGI Project was developed by the College Counseling Psychologists in September 1974 and submitted to the College SIGI Project Director. The Research Design called for a Pilot Study, which was conducted from March 17, 1975 to December 17, 1975.

The Research Design developed by the Pasadena City College Counseling Psychologists represents only one aspect of a three-fold evaluation of the SIGI Project at Pasadena City College. In addition to this inhouse evaluation, other evaluative studies will include a review by an outside independent evaluator and a

comprehensive evaluation to be designed and conducted by the SIGI staff of the Educational Testing Service.

The Pasadena City College SIGI research called for a classical design including Experimental and Control groups. A discussion of the problems and limitations of such a design was presented in the Pasadena City College SIGI Project Research Design, September 20, 1974.

The Pilot Study followed the procedures set forth in the Research Design except for an extension of the time schedule and a reduction in the number of students involved. The original plan was for the Pilot Study to include 150 students in the Experimental group and 150 students in the Control group during the period from September 1974 to February 1975. Delays in obtaining the SIGI hardware, developing the software, and getting both operational, caused the Pilot Study to be extended to December 17, 1975. Even with this extension, only 50 students in the Experimental SIGI group and 50 students in the Control Vocational Testing and Counseling group had completed all aspects of the program. The decision was made to conclude the preliminary Pilot Study in December 1975, accepting the limitation of the small number involved.

PROCEDURE

Students at Pasadena City College were informed about the purposes and availability of the SIGI project by newspaper articles and flyers. Applicants were given additional information about the program and were asked to submit a registration form. Assignment to a

group was on a random basis. Each applicant drew one marker from a box that contained two markers, one labeled Experimental; one labeled Control. Those who drew assignment to the Experimental group made appointments to use SIGI; the Control group began with the testing program.

Following these different treatments, the students in the Experimental group had individual follow-up conferences with one of three assigned SIGI counselors. Those in the Control group had individual follow-up conferences with their own counselors.

COLLECTION AND TREATMENT OF THE DATA

Basic data were collected from questionnaires completed by students and counselors. The following instruments were used:

1. Registration Form - Experimental Career Guidance Project - Completed by all students prior to their participation in the project.

2. SIGI Evaluation Questionnaire (SEQ) - Given to the Experimental group only and completed after their exposure to SIGI.

3. Occupational Information Questionnaire (OIQ) - Given to all students and completed following final counseling conference.

4. Counselor Questionnaire (CQ) - Completed by counselors for all students.

5. Student Questionnaires (SQI and SQII) - Completed by all students following the final counseling conference.

Additional information was gathered from student records.

The criteria selected for study were those that could be measured effectively and were related directly to the basic objectives of the project. The Pilot Study involved all criteria delineated in the SIGI Project Research Design.

Chi Square was the nonparametric statistical techn que chosen to test the hypotheses of the differences between the two groups involved. Following standard procedure, differences found between the two groups have been identified as <u>significant</u> when the .05 level of confidence was reached, and <u>very significant</u> when the level of confidence exceeded the .01 level.

In order for the Chi Square technique to be appropriately used, certain conditions should be satisfied. Cochran has recommended that for X^2 tests with degrees of freedom larger than 1, fewer than 20 percent of the cells should have an expected frequency of less than 5, and no cell should have an expected frequency of less than 1. Siegel has noted that if the requirements are not met by the data in the form in which they were originally collected, the researcher must combine adjacent categories so as to increase the expected frequencies in the various cells. It was further noted that adjacent categories which are to be combined must have some common property or mutual identity if interpretation of the outcome of the test

after the combining is to be possible.

In consideration of the above recommendations, the following criteria were reviewed for possible modification in data assignment:

Criteria	Modification
4	6 cells combined into 4
9	6 cells combined into 4
11	6 cells combined into 4
12	6 cells combined into 4
16	No logical basis for combining
17	8 cells combined into 6
18	8 cells combined into 6
19	8 cells combined into 6
20	8 cells combined into 6
21	8 cells combined into 6

Modifications were made when appropriate.

SAMPLE

The Pilot Study Sample is described in TABLE 1.

TABLE 1

SAMPLE DESCRIPTION FOR THE PILOT STUDY

	EXPERIMENTAL		CONTROL		PASADENA CITY COLLEGE
	N	Percentage	N	Percentage	Population Percentage
SEX					
Male	17	34%	24	48%	50%
Female	33	66%	26	52%	50%
Total	50		50		
AGE					
17	3	6%	2	4%	2%
18 - 23	36	72%	33	66%	49%
24 - 30	5	10%	6	12%	22%
31 over	6	12%	9	18%	27%
Total	50		50		
ETHNIC					
Black	5	10%	3	6%	15%
Mexican/American	3	6%	2	4%	9%
Oriental	1	2%	2	4%	3%
Other	1	2%	0	0%	2%
White	40	80%	43	86%	71%
Total	50		50		
MAJOR/VOCATIONAL GOAL					
Two-year Educational or Vocational Objective	5	10%	8	16%	21%
Four-year or Academic Objective	31	62%	36	72%	39%
Undecided	14	28%	6	12%	40%
Total	50		50		

BASIC QUESTIONS

When participation in the SIGI Research Project was still under discussion, several basic questions were raised. Most of these are listed below with tentative answers based on the limited Pilot Study which involved the first 100 Pasadena City College students who requested an opportunity to use SIGI and who completed all aspects of the study.

1. Will SIGI, with its obvious mechanical and technical aspects, appeal more to males than to females?
   - Forty-one males and 59 females asked to use SIGI and completed all segments of the Pilot Study.

2. Is reading ability a factor? Will slow readers need more time than fast readers to complete the SIGI program?
   - There was no significant relationship (r=.16) between reading scores and time spent with SIGI.

3. Will SIGI appeal to all age groups?
   - All age groups were represented among SIGI applicants. Two-thirds of the SIGI applicants in the Pilot Study were between 18 and 23 years of age. TABLE 2 shows the SIGI applicants and college population age breakdowns.

TABLE 2

Age	SIGI Applicants	College Population
17	6%	2%
18-23	72%	49%
24-30	10%	22%
over 31	12%	27%

4. Will SIGI appeal to ethnic minorities?

   - Ethnic breakdown in the Pilot Study is generally similar to the ethnic distribution of students at Pasadena City College.

TABLE 3

Ethnic Group	SIGI Applicants	College Population
Black	10%	15%
Mex.-Amer. Sp. Surname	6%	9%
Oriental	2%	3%
Other	2%	2%
White	80%	71%

5. Will SIGI appeal to students in two-year occupational curricula as well as to those who are academic majors and are planning to transfer to four-year colleges?

   - Two-thirds of the SIGI applicants were academic majors.

TABLE 4

Major/Vocational Goal	SIGI Applicants	College Population
Voc. or Two-Year Curric.	10%	21%
Acad./Four-Year Curric.	62%	39%
Undecided	28%	40%

6. What are the costs of SIGI?

   - There are many ways of examining the costs and benefits of SIGI. Costs may be considered in three logical divisions: (A) Set up costs; (B) The proportion of

time regularly employed college personnel devote to SIGI plus the housing expense; (3) The ongoing costs attributable exclusively to SIGI*

(A) Set up Costs

Set up costs at Pasadena City College included hardware acquisition as follows:

PDP-11 Computer	$64,825.00	
Delta Data CRT's - 2 @ $3,170	6,340.00	
Texas Instrument Printer	1,450.00	
Okidata Printer	1,725.00	
	$74,340.00	
Tax	4,460.00	=
		Total $78,800
Personnel assigned exclusively to SIGI (annually)		$17,250

(B) College Time and Housing Expenses

Many persons at the College have been involved with SIGI. The Pasadena City College Dean of Counseling is the SIGI Project Director. He has spent a great deal of time developing the SIGI program for the Pasadena City College Campus. Much time has been given also by the Pasadena City College Director of Computer Services. To a much lesser extent, the College psychologists, counselors, administrative personnel, and others have contributed services. A Student Personnel Assistant has devoted full time to the program since August 1974. Thirty clerical days were used to collect data relating to the development of the SIGI prediction system.

*A portion of the set up and personnel costs at Pasadena City College were met by California Vocational Education Act funds.

SIGI terminals are housed in a small separate room in the College Career Guidance Center.

(C) Ongoing Costs

The ongoing costs listed below include only expendable supplies, SIGI maintenance, and rental costs.

	Annual Cost
Cost of Paper	$ 186.00
Maintenance of SIGI Equipment	3,972.00
Rental Costs	2,040.00
	$6,198.00

During the nine months of the Pilot Study, 50 students completed the SIGI program. If only the annual ongoing SIGI costs were considered and prorated for nine months among the 50 students, the average cost per student was $93.00. This cost per person is not excessive when compared to charges in the community for career testing and counseling ($235.00 at U.C.L.A.).

It should be emphasized that these costs were computed for the Pilot Study and are not representative of future ongoing costs when the evaluation research is finished. There were many delays in getting the SIGI program fully operational and in obtaining full utilization of the SIGI equipment. Even today the constraints of the research place many restrictions on SIGI's use. As the phase of research and development at the local level winds down, the special personnel salary costs now devoted to the SIGI project will be redirected to the general area of career guidance services at the College.

With greater efficiency, and with the use of the second terminal and printer which became available to students in March 1976, there will be a substantial reduction in ongoing costs per student. The Project Director estimates that when the evaluation study is completed, 1,100 students will use SIGI annually with the hardware now in operation on the campus. Projected ongoing costs for SIGI exclusive of counseling time, based on 1,100 students per year, are as follows:

Supplies	$2,000.00
Rental and Maintenance	8,600.00
	$10,600.00

Cost per student: $9.64

Just as there are various ways of specifying the costs of SIGI, there are also many ways to describe its benefits. The most obvious value is in the interaction between SIGI and the individual student who is seeking aid in making career decisions. But, in addition, the very presence of SIGI on a college campus does much to generate greater interest in career planning among counselors, administrators, and teachers, as well as among the students. Through their acquaintance with SIGI, counselors become better career guidance counselors as their interest is stimulated and as they become more knowledgeable about careers and the process of making career decisions.

II. FINDINGS

All of the original criteria chosen for inclusion in the SIGI Research Design were studied. The basic findings are listed below:

CRITERIA

1. Success in career objective as measured by completion of the 1974-75 school year. This was changed for the purposes of the Pilot Study as follows: "Success in career objective as measured by completion of the semester in which the student participated in the study."

   Findings: (A) Completion Distribution

	Withdrew	Completed
Control	4	46
Experimental	6	44

(B) Statistical Analysis

X^2 - 0.44
- Not Significant

2. Success in college as measured by g.p.a. for 1974-75. This was changed for the purposes of the Pilot Study as follows: "Success in college as measured by g.p.a. for the semester in which the student participated in the study."

   Low.....2.4 Middle.....2.5 - 3.4 High.....3.5+

   Findings: (A) Grade Distribution

	Low	Middle	High
Control	9	22	15
Experimental	6	23	16

Note: Grades for some students were not available.

(B) Statistical Analysis

X^2 - 0.67
- Not Significant

3. Degree of satisfaction with current educational plans as determined by students' self ratings. Measured by response to item #3 - SQI and SQII, "How satisfied are you with your current educational plans? Very Satisfied___ Satisfied___ Not Satisfied___"

Findings: (A) Student Ratings

	Not Satisfied	Satisfied	Very Satisfied
Control	12	29	9
Experimental	4	22	24

(B) Statistical Analysis

X^2 - 11.78
- Significant at .01 level

4. Degree of confidence in succeeding in current educational plans as determined by students' self ratings. Measured by item #4 - SQI and SQII, "How confident are you of succeeding in current educational plans? Very confident___ Confident___ Not Confident___"

Findings: (A) Student Ratings - Original

	Not Confident	Confident	Very Confident
Control	4	32	12
Experimental	2	16	32

Note: All students did not complete all measured items on each questionnaire. Thus, some ratings did not equal the total of 50 students in each group.

(B) Student Ratings - Combined

	Less Than Very Confident	Very Confident
Control	36	12
Experimental	18	32

Note: Category titles were changed for clarity.

(C) Statistical Analysis (Combined Ratings)

X^2 - 14.88
- Significant at .01 level

5. Degree of satisfaction with current vocational plans as determined by students' self ratings. Measured by response to item #5 - SQI and SQII, "How satisfied are you with your current vocational plans? Very Satisfied ____Satisfied____ Not Satisfied____"

Findings: (A) Student Ratings

	Not Satisfied	Satisfied	Very Satisfied
Control	16	25	8
Experimental	6	23	18

(B) Statistical Analysis

X^2 - 8.54
- Significant at .05 level

6. Degree of confidence in succeeding in vocational plans as determined by students' self ratings. Measured by response to item #6 - SQI and SQII, "How confident are you of succeeding in current vocational plans? Very confident___ Confident___ Not Confident___"

Findings: (A) Student Ratings

	Not Confident	Confident	Very Confident
Control	11	25	11
Experimental	3	25	19

(B) Statistical Analysis

X^2 - 6.70
- Significant at .05 level

7. Students' expressed need for help with educational planning. Measured by response to item #7 - SQI and SQII, "What is your current need for help with educational planning?"

Findings: (A) Student Ratings

	No Help Needed	Help Needed	Much Help Needed
Control	5	35	10
Experimental	34	14	2

Note: Category titles have been changed.

(B) Statistical Analysis

X^2 - 35.90
- Significant at .01 level

8. Students' expressed need for help with career planning. Measured by response to item #8 - SQI and SQII, "What is your current need for help with vocational planning?"

Findings: (A) Student Ratings

	No Help Needed	Help Needed	Much Help Needed
Control	13	25	12
Experimental	23	20	4

Note: Category titles have been changed.

(B) Statistical Analysis

X^2 - 7.39
- Significant at .05 level

9. Extent of students' knowledge of college course requirements as determined by self ratings. Measured by response to item #9 - SQI and SQII, "Indicate the extent of your knowledge of college course requirements."

Findings: (A) Student Ratings - Original

	Very Limited Knowledge	Some Knowledge	Adequate Knowledge
Control	5	30	15
Experimental	0	20	30

(B) Student Ratings - Combined

	Very Limited and Some Knowledge	Adequate Knowledge
Control	35	15
Experimental	20	30

(C) Statistical Analysis (Combined Ratings)

X^2 - 9.08
- Significant at .01 level

10. Extent of students' knowledge of entry level requirements for their chosen career as determined by self ratings. Measured by response to item #10 - SQI and SQII, "Indicate extent of your knowledge of entry level requirements."

Findings: (A) Student Ratings.

	Very Limited Knowledge	Some Knowledge	Adequate Knowledge
Control	16	26	8
Experimental	9	24	16

(B) Statistical Analysis

X^2 - 4.70
- Not Significant

11. Probability of success in students' educational program as determined by counselors' ratings. Measured by response to item #2 - CQ. "Rate the probability of the student succeeding in his chosen educational program."

Findings: (A) Counselors' Ratings of Students- Original

	Little Probability	Reasonable Probability	High Probability
Control	3	21	20
Experimental	1	22	26

(B) Counselors' Ratings of Students - Combined

	Less Than High Probability	High Probability
Control	24	20
Experimental	23	26

(C) Statistical Analysis

X^2 - 0.55
- Not Significant

12. Probability of students' attaining stated vocational goal as determined by counselors' ratings. Measured by response to item #3 - CQ, "Rate the probability of the student attaining his chosen vocational goal."

Findings: (A) Counselors' Ratings of Students - Original

	Little Probability	Reasonable Probability	High Probability
Control	4	21	18
Experimental	2	20	27

(B) Counselors' Ratings of Students - Combined

	Less Than High Probability	High Probability
Control	25	18
Experimental	22	27

(C) Statistical Analysis

X^2 - Statistical Analysis
- Not Significant

13. Extent of students' information about chosen occupation as measured by scores on Occupational Information Questionnaire. Measured by total raw scores on OIQ. Maximum score was 45. Scores ranged from 0-42. Median scores were as follows: Control Group - 21, Experimental Group - 28. Scores were assigned to the following categories: Little Information 0-15, Adequate Information - 16-30, More Than Adequate Information - 31-42.

Findings: (A) Student Scores

	Little Information	Adequate Information	More Than Adequate Information
Control	15	25	10
Experimental	4	25	21

(B) Statistical Analysis

X^2 - 10.22
- Significant at .01 level

14. Value of post-SIGI and post-vocational test interpretation counseling sessions as measured by student ratings. Information obtained from item #11 - SQI and SQII, "All students have had individual conferences with their counselors. At these conferences your SIGI (vocational testing) materials were reviewed and career plans discussed. How valuable were these conferences to you?"

Findings: (A) Student Ratings

	Little Value	Valuable	Much Value
Control	8	22	20
Experimental	3	25	22

(B) Statistical Analysis

X^2 - 2.56
- Not Significant

15. SIGI users only - Value of the SIGI experience. Measured by rating sheet. Items #14 and #16 - SEQ. Item #14 - "Circle the grade that you would give SIGI on each of the following." On this item a composite score was obtained and assigned to one of three categories. Item #16 - "In summary, was SIGI helpful to you?" Responses on this item were combined into categories.

Findings: (A) Student Ratings - Item #14

	No Value	Valuable	Much Value
Male	13	43	131
Female	5	30	156

(B) Statistical Analysis

x^2 - 8.68
- Significant at .05 level

(C) In addition, the percentages of responses for each subsection of item #14 were computed and are listed on the next page.

Question -"Circle the grade that you would give SIGI on each of the following: (A - very high, F - very low)"

	Percentages					
	A	B	C	D	E	F
- General interest	52	38	10			
-Clarity of directions	67	19	12		2	
- Helping you to become more aware of your values	66	22	12			
- Helping you to understand that values are related to career decisions	69	23	4	4		
- Helping you to find out which occupations fit your values	58	17	17	4		4
- Helping you to obtain information about occupations	44	20	24	8	4	
- Helping you to plan a program that is appropriate for an occupation that you are considering	18	24	43	6	3	6
- Helping you to learn how to make career decisions	24	42	26	8		

(D) Student Ratings - Item #16

	Not Helpful	Helpful
Males	4	20
Females	0	24

Note: Categories were combined.

(E) Statistical Analysis

X^2 - 3.28 Note: Yates' Correction for Continuity was applied.
- Not Significant

(F) The percentages of responses for each subsection of item #16 were computed and are listed below:

Question - "In summary, was SIGI helpful to you?"

Responses	Percentages
- Very much so. I was completely satisfied----------	24
- Yes, it was very helpful----------	68
- It was not very helpful----------	6
- I would have received more help if I had just talked to a counselor without using SIGI----------	2
- No, SIGI was a waste of time----------	0

16. Realistic nature of change in students' career objective. Measured by counselors' ratings. (Only those students who change career objectives.) Measured by item #4 - CQ.

Findings: (A) Counselors' Ratings of Students

	Less Realistic	More Realistic	No Difference
Control	0	20	5
Experimental	1	22	1

(B) Statistical Analysis - Distribution of ratings contraindicated a statistical analysis

17. Degree of students' knowledge of how to make career decisions as determined by counselors' ratings. Measured by responses to item #5 - CQ.

Findings: (A) Counselors' Ratings of Students

(A - highest rating, D - lowest rating)

	D & C	B	A
Control	21	19	9
Experimental	14	23	11

(B) Statistical Analysis

X^2 - 1.90
- Not Significant

18. Degree of students' information about specific occupations as determined by counselors' ratings. Measured by responses to item #6 - CQ.

Findings: (A) Counselors' Ratings of Students

(A - highest rating, D - lowest rating)

	D & C	B	A
Control	20	24	5
Experimental	16	19	13

(B) Statistical Analysis

X^2 - 4.62
- Not Significant

19. Degree of students' knowledge of course requirements for specific occupations as determined by counselors' ratings. Measured by responses to item #7 - CQ.

Findings: (A) Counselors' Ratings of Students

(A - highest rating, D - lowest rating)

	D & C	B	A
Control	20	20	9
Experimental	19	13	16

(B) Statistical Analysis

X^2 - 3.61
- Not Significant

20. Degree of students' knowledge of desired outcomes from the counseling conference as determined by counselors' ratings. Measured by responses to item #8 - CQ.

Findings: (A) Counselors' Ratings of Students

(A - highest rating, D - lowest rating)

	D & C	B	A
Control	9	27	12
Experimental	13	17	18

(B) Statistical Analysis

X^2 - 4.18
- Not Significant

21. Overall value of the counseling conference as determined by counselors' ratings. Measured by responses to item #9 - CQ.

Findings: (A) Counselors' Ratings of Students

(A - highest rating, D - lowest rating)

	D & C	B	A
Control	6	27	16
Experimental	5	13	30

(B) Statistical Analysis

X^2 - 9.39
- Significant at .01 level

22. Degree of change in students' sureness in choice of college program and occupation as measured by self ratings. Measured by responses to item #12 - SQI and SQII.

Findings: (A) Student Ratings

	Less Sure	No Change	More Sure
Control	6	22	22
Experimental	5	24	21

Note: Category titles have been changed.

(B) Statistical Analysis

X^2 - 0.20
- Not Significant

23. Degree of change in students' knowledge of factors which are important in making career decisions as measured by self ratings. Measured by responses to item #13 - SQI and SQII.

Findings: (A) Student Ratings
Note: There were no ratings in the "Less Knowledge" category.

	No Change	More Knowledge
Control	24	25
Experimental	17	33

Note: Category titles have been changed.

(B) Statistical Analysis

X^2 - 2.26
- Not Significant

24. Degree of change in students' knowledge of the occupation and college program of their choice as measured by self ratings. Measured by responses to item #14 - SQI and SQII.

Findings: (A) Student Ratings
Note: There were no ratings in the "Less Knowledge" category.

	No Change	More Knowledge
Control	25	23
Experimental	26	22

Note: Category titles have been changed.

(B) Statistical Analysis

X^2 - 0.04
- Not Significant

25. Amount of time devoted to post-SIGI or post-vocational test counseling sessions. Note: Original categories were modified to reflect actual distribution.

Findings: (A) Breakdown of Time

	Less Than One Hour	One-Two Hours
Control	24	26
Experimental	12	38

(B) Statistical Analysis

X^2 - 6.24
- Significant at .05 level

26. Reading Ability. Measured by raw score on the Reading Section of the Wide Range Achievement test. SIGI users only.

Findings: (A) Raw scores ranged from 51 to 88. Equivalent grade placement range was from 8.5 to 19.0.

(B) Median raw score was 80. Grade placement was 16.5.

(C) The WRAT raw scores were correlated with time spent on SIGI. The positive correlation was .159. (Not significant)

(D) It was noted that the two students who ranked highest in reading ability also ranked 1-2 in terms of time spent on SIGI.

27. Reaction to the SIGI Experience. The fifty students in the Experimental group were asked several questions relating to their experience with SIGI. (A summary of the results from the SIGI Evaluation Questionnaire (SEQ) follows.)

Number of Responses*	
	1. What is the primary reason you chose to use SIGI to assist you with your vocational plans?
22	A. I was curious regarding this program for career guidance and wanted to learn more about it____
1	B. I had decided to change my career plans____
16	C. I was undecided in regard to my career plans and needed more information____

*Note: Totals do not always equal 50.

Number of Responses	
5	D. I was considering changing my career plans____
7	E. I felt quite confident about my career plans but still had a few doubts or questions____
8	F. I wanted to confirm my career plans____

2. Did you need assistance while working with the SIGI computer terminal?

29	A. Only for initial instructions____
13	B. Yes, twice____
4	C. Yes, three times____
3	D. Yes, four times or more____
2	E. No assistance needed____

3. Did you have all the information you needed to use SIGI effectively?

36	A. Yes____
2	B. No, but the needed information was supplied by the counselor____
7	C. No, but the needed information was easily obtained____
5	D. No, but I got along all right without it____
0	E. Because I didn't have the information I needed, the computer was not very helpful to me____

4. Tentative occupational choice prior to use of SIGI____

5. When you first came to SIGI, how confident of your occupational plans were you?

9	A. I came to SIGI not knowing what I wanted to do____
13	B. I came to SIGI having several alternatives____

Number of Responses

14 C. I came to SIGI with questions or doubts about my occupational plans____

13 D. I came to SIGI with confidence in my occupational plans____

6. Tentative occupational choice now_____

7. Now, how confident of your plans are you? (Check as many as appropriate)

9 A. I am still uncertain____

20 B. I have a much better idea now____

5 C. SIGI helped me to choose one____

15 D. SIGI helped confirm the choice I had already made____

18 E. SIGI suggested other things which I am considering___

8. How was SIGI helpful? (Check all that apply)

31 A. Assisted me to think about my interests____

25 B. Assisted me to think about my abilities____

46 C. Assisted me to think about my values____

19 D. Assisted me in making career plans____

36 E. Assisted me to obtain more information about occupations____

15 F. Assisted me to obtain more information about college programs____

18 G. Assisted me in teaching me how to make career decisions____

2 H. It was not helpful____

Number of Responses

9. What was the most useful section of SIGI for you?

31 A. Values____

21 B. Information____

10. Is there anything SIGI didn't cover that you would like it to cover? What_____

Accurate Assessment of ability
Specific information on colleges
Additional occupational choices
More information on course requirements for occupational preparation
Need better planning section
More information on job opportunities, especially in this geographic area
Occupational information regarding -
- Corporate and criminal law
- Electronic engineer
- Language translation
- Millinery
- Work in National and State parks
- Printing
- Occupations in the theater (not acting)
- Rehabilitation counselor
- Travel agent

11. Did you have any trouble locating an occupation in which you are interested?

15 Yes___
35 No____

12. Were there any occupations missing from SIGI in which you are interested?

25 Yes____ If yes, list occupations

- Biochemistry
- Creative Writing
- Dental Technician
- Fiction Writer
- Foreign Service Officer
- Greenhouse Worker
- Metallurgy
- Motion Picture Industry
- Museum Curator
- Newswriting
- Plant Manager
- Proofreader
- Quality Control
- Shipping and Sea Work
- Theater Production and Management
- Translator

25 No____

Number of Responses

13. Is there any area you would like to have covered more fully?

18 Yes____
28 No____

14. Circle the grade that you would give SIGI on each of the following: (A - very high, F - very low)

		Number of Responses					
		A	B	C	D	E	F
A.	General Interest	26	19	5	0	0	0
B.	Clarity of Directions	34	10	6	0	0	0
C.	Helping you to become more aware of your values	33	11	6	0	0	0
D.	Helping you to understand that values are related to career decisions	30	16	2	2	0	0
E.	Helping you to find out which occupations fit your values	27	11	8	2	0	0
F.	Helping you to obtain information about occupations	22	10	12	4	2	0
G.	Helping you to plan a program that is appropriate for an occupation you are considering	9	12	21	3	1	3
H.	Helping you to learn how to make career decisions	12	21	13	4	0	0

15. Did SIGI help you to make better use of your counselor's time? (Check as appropriate)

35 A. After using SIGI, I felt the time I spent with the counselor was of greater value than if I had not used SIGI____

Number of Responses	
7	B. After using SIGI, I felt there was no need to to see a counselor____
5	C. After using SIGI, I felt the need to see a counselor more than ever____

16. In summary, was SIGI helpful to you?

12	A. Very much so. I was completely satisfied____
34	B. Yes, it was very helpful____
3	C. It was not very helpful____
1	D. I would have received more help if I had just talked to a counselor without using SIGI____
0	E. No, SIGI was a waste of time____

17. Do you expect to return to Pasadena City College next semester?

41	Yes____
9	No____

18. Would you like to use SIGI again?

24	Yes____
16	No____
5	Possibly____

28. Student Background Information - Presented on TABLE 1.

SUMMARY OF SIGNIFICANT FINDINGS

CRITERIA	When compared to students in the Control group,
3	students in the Experimental group expressed a higher degree of satisfaction with current educational plans.**
4	students in the Experimental group expressed a higher degree of confidence in succeeding in educational plans.**
5	students in the Experimental group expressed a higher degree of satisfaction with current vocational plans.*
6	students in the Experimental group expressed a higher degree of confidence in succeeding in current vocational plans.*
7	students in the Experimental group expressed less need for help with educational planning.**
8	students in the Experimental group expressed less need for help with career planning.*
9	students in the Experimental group expressed a higher degree of knowledge of college course requirements.**
13	students in the Experimental group had more information about their chosen occupations.**
15	Within the Experimental group, female students expressed a higher value rating for SIGI than did the male students.*
21	Counselors rated the overall value of the counseling conference higher for students in the Experimental group.**
25	students in the Experimental group had longer follow-up counseling sessions.*

* Statistically significant at the .05 level
**Statistically significant at the .01 level

SUMMARY OF NONSIGNIFICANT FINDINGS

CRITERIA	There was no statistically significant difference between the two groups in
1	their completion of the current semester.
2	their success in college as measured by grade point average for the current semester.
10	knowledge of entry level requirements for their chosen careers.
11	the probability of success in their educational programs, as rated by counselors.
12	the probability of attaining their stated vocational goals, as determined by counselor ratings.
14	the value of the (post-SIGI or post-vocational testing) follow-up counseling sessions, as judged by the students.
17	knowledge of how to make career decisions, as rated by counselors.
18	information about specific occupations, as rated by counselors.
19	knowledge of course requirements for specific occupations, as rated by counselors.
20	knowledge of desired outcomes from the counseling conferences, as rated by counselors.
22	sureness in choice of college program and occupation following their experiences with SIGI or vocational tests.
23	degree of change in students' knowledge of factors which are important in making career decisions, according to student ratings.
24	the degree of change in students' knowledge of the occupation and college of their choice, according to student ratings.

III. DISCUSSION OF THE FINDINGS

CRITERIA	DISCUSSION
1	No difference was found between the Experimental and Control groups in success in career objective as measured by completion of the semester in which the student participated in the project. Students may withdraw from college for many reasons. Furthermore, if students discover they are taking classes that are inappropriate to their career objectives, they may withdraw in preparation for moving ahead in a new direction. In any event, one semester in college is too short a time to measure success in pursuit of a career objective. Attention should be given to completion of the education or training necessary for entry into the chosen occupation. This should be pursued in follow-up studies.
2	No difference was found between the two groups in terms of success in college as measured by grade point average for the semester in which the student participated in the study. The comment above on Criteria 1 applies also to Criteria 2.
3	Students who used SIGI indicated they were more satisfied with their educational plans than the students who received the traditional testing and

CRITERIA

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counseling. The difference was highly significant, beyond the .01 level. In this instance, and in all of the other significant findings reported, the Hawthorne Effect should not be overlooked. All applicants knew they were participants in a study to evaluate the effectiveness of SIGI. Those who used SIGI knew they were in the Experimental group. Likewise, those who received the traditional testing knew they were in the Control group. It has been found that students who know they are in experimental situations may perform better because of expectations and other motivational factors. Still, the obvious must not be overlooked: The students who used SIGI did indicate they were more satisfied with their educational plans than did the students who had the traditional career testing and counseling.

4 Students may be satisfied with their educational plans but are they also more confident that they can complete the educational program successfully? The students who used SIGI expressed greater confidence in being successful in their educational plans than those who received the vocational testing and counseling. The difference between the two groups was at a highly significant level.

CRITERIA	DISCUSSION
5	It is possible for a student to be satisfied and confident of success with educational plans but to have reservations about the satisfaction and success he will have in the occupation itself. The students who used SIGI expressed greater satisfaction than did those in the Control group with their current vocational plans. The difference between the two groups was not as large as in the cases of Criteria 3 and 4. Still, the difference was at a statistically significant level.
6	The students using SIGI were also more confident of succeeding in their chosen vocations. The difference between the Experimental and Control group was highly significant.
7	Is the experience with SIGI or that of taking vocational testing and counseling more complete in helping students with their educational planning? In this Pilot Study, the students who had the testing and counseling expressed a greater need for additional assistance in educational planning. The difference between the two groups was highly significant.
8	The students exposed to SIGI also expressed less need for assistance with career planning. The difference between the Experimental and Control group was

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less than the need for assistance with educational planning, but still it was significant.

9 The students who used SIGI had more knowledge of course requirements to prepare for their occupational goals than did those in the Control group who had the traditional testing and counseling. The difference was at a highly significant level.

SIGI has a section which lists the course requirements for whatever occupations students may wish to examine. By pressing a key on the terminal, students may receive a printed copy of these course requirements which they may take with them. At the present time, it is not current practice for Pasadena City College counselors, who use the traditional testing and counseling, to give students a handout which lists course requirements for a particular major, or preparation for a particular occupation, although much of this information is to be found in the College catalog. The difference in knowledge of course requirements between the Experimental and Control groups, as identified by this study, suggests the value of having counselors give a handout which includes a list of course requirements to all students who come to them for assistance with career planning.

CRITERIA	DISCUSSION
10	There were indications that the SIGI group had more knowledge of entry level requirements for their chosen occupations but the difference was not significant at the .05 level.
11	Do counselors see the students' probability of success in their educational and vocational plans in the same way as the students see themselves? In this Pilot Study there was no statistically significant difference in the way the counselors saw the students who had the SIGI experience and those who had the traditional counseling in terms of estimated probability of success.

This finding is intriguing and requires special comment. The students in the SIGI group expressed greater confidence of success than the students who received the traditional testing and counseling, but the counselors for the two groups saw no difference between them. This finding raises again the issue of the Hawthorne Effect. Did the students who were in the SIGI Experimental group have more confidence of success because they were part of an experimental group or because they had made better career choices?

This question could be answered if the research were organized so that the subjects did not know

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whether they were in the Experimental or Control group. Or, all students could be given both treatments, that is, both SIGI and the traditional testing and counseling. One group could receive the tests first, the other group could use SIGI first. Evaluations could be made. Then the treatments would change and the students who had the SIGI experience could be given the tests, and the tested students could use SIGI. Again, the evaluations could be conducted.

12 Counselors may see students as obtaining success in their educational plans but do they see the students as being successful also in their chosen occupations? As in the case of Criteria 11 described above, the counselors of the students in the two groups do not see them as being significantly different in terms of probability of success in their occupations. It may be well to repeat, the students in the SIGI group were more confident of success than were those in the Control group, but the counselors did not see the students as different in this regard.

13 Did the students who used SIGI have more information about their chosen occupations than those who received the traditional career guidance counseling?

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An Occupational Information Questionnaire was developed in an endeavor to answer this question. Using the objective scores from this information questionnaire as the criterion, the SIGI students scored higher at a very significant level. Now, this is one criterion where the Hawthorne Effect is probably not operative. The score on the questionnaire was not a matter of performance or subjective rating, but rather of the amount of occupational information the student had accumulated.

The printout capability of SIGI is one of its valuable features. When SIGI users obtain information about occupations which they would like to keep, the information may be duplicated on paper for their personal use.

Here again, the findings of the Pilot Study suggest a method which might improve career counseling at Pasadena City College. Occupational information on careers could be duplicated, filed, and given to students upon request or whenever appropriate.

14 Does SIGI or Vocational testing provide the best foundation for career guidance counseling? There was no difference between SIGI users and the students who took the traditional vocational testing in terms of

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the value they placed on the conferences with their counselors to review career information and to discuss career plans.

15 Item #15 was not a criterion used to compare the students in the two groups. It pertained to SIGI users only. The question was, "In summary, was SIGI helpful to you?" The responses of the male SIGI users was compared to the responses of the female SIGI users. The female users rated SIGI as of greater value than did the male users, the difference being statistically significant. (See also discussion of Criteria 27, especially items SEQ #14, #15, and #16, page 49.)

16 Approximately one-half of the students in the Experimental group and one-half in the Control group changed their career objective following their vocational testing or experience with SIGI. Counselors were of the opinion that better than 80 percent of these students made decidedly more realistic choices. In only one case did a counselor believe the student's new choice was less realistic.

17 The authors of SIGI claim its purpose, its major strength, to be its aid in helping students to make better career decisions. In this Pilot Study the counselors did not see a significant difference between the

CRITERIA	DISCUSSION
	two groups in regard to the students' knowledge of how to make career decisions.
18	Referring to Criteria 13, it was found that SIGI users actually had more information about their chosen occupations than did those in the Control group who took the traditional vocational testing. When the counselors were asked their subjective opinion of their counselees' information about specific occupations (Criteria 18), there was a trend toward seeing the students in the Experimental group as having more information about occupations, but the difference between the two groups was not significant.
19	Counselors were asked to rate the students in the two groups in terms of their knowledge of course requirements for preparation for their chosen occupation. Although there was a tendency for counselors to give the students in the SIGI group higher marks, the difference in their ratings of the students in the two groups was not large enough to be statistically significant. When larger numbers of students are involved, the difference may turn out to be significant but any such conclusion must be deferred until more data are available.

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20 After the students took the vocational tests or used SIGI, they had follow-up conferences with counselors for the purposes of interpretations, discussion, and planning. One question was whether the students' experience with SIGI would clarify their expectations of the counseling conference. According to counselors' ratings in the Pilot Study, there was no significant difference between the two groups in terms of knowledge of expected outcomes from the counseling conference.

21 There was also the question of whether SIGI would prepare students to make better use of the time in their conference with counselors. According to the counselors' ratings, this was the case. The counselors believed that the overall value of the counseling conferences was greater for the students who had the SIGI experience than it was for the students who had the traditional testing. The difference in the counselors' ratings for the two groups was highly significant.

22 After the students took the vocational tests or interacted with SIGI, they were asked whether their experiences had made them more sure in their choices of college programs and occupations. Approximately

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43 percent of the students in both groups indicated that they were more sure of their choices following the treatments. There was no statistically significant difference between the two groups in this regard.

23 The students in both groups were asked also if their experiences gave them more knowledge of factors which are important to consider in making career decisions. Although there was a trend in favor of those in the Experimental (SIGI) group having the greater awareness, the difference between the two groups was not of such magnitude as to be statistically significant.

24 Prior topics have included a discussion of the students' actual information about their chosen occupation, and student and counselor ratings of students' knowledge of course and occupational requirements. Finally, the students were asked whether their experiences did in fact provide them with more knowledge in these areas. Forty-six percent in the Control group and 44 percent in the Experimental group indicated that they had more knowledge of occupations and college programs as a consequence of their career guidance experiences, but there was no statistically significant difference between the students in the two groups in this regard.

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25 Some have asked whether SIGI reduces the time counselors spend in career counseling with students. The Pilot Study indicated that students who have the SIGI experience actually spend more time in follow-up career guidance counseling than do the students who take the traditional testing. The difference between the groups was significant.

The developers of SIGI have not suggested that SIGI will reduce counseling time. SIGI is supported for its ability to help students make better career decisions. There may be many reasons why students spent more counseling time post-SIGI than post-vocational testing. Perhaps some discussions went beyond career counseling to general reaction to the novelty of the SIGI experience. SIGI may have raised more questions.

26 A few educators who have examined the SIGI program have questioned whether reading ability would influence the time students would spend with the SIGI terminal. Do poor readers require an inordinate amount of terminal time?

All students in the Experimental group were given the reading section of the WRAT (Wide Range Achievement Test). Their reading scores were correlated with

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the time they spent on the terminal. The correlation of .16 was not significant. Contrary to expectations, the two students who had the highest reading score were also the two students who spent the most time at the SIGI terminal.

The time individuals spent with the terminal varied from two hours and fifteen minutes to seven hours and thirty minutes, with a Median of four hours and zero minutes, and a Mean of four hours and three minutes.

27 All students in the Experimental group were asked to complete the SIGI Evaluation Questionnaire (SEQ). A tabulation of these responses may be found in the FINDINGS section of this report. Although the tabulation is self-explanatory, brief comments on selected questions follow.

SEQ Item #2 - Forty percent of the Experimental group needed assistance two or more times while they were seated at the SIGI terminal. During the early phase of the Study, some difficulties were encountered in the operation of the terminal. These problems now have been resolved. At the present time, very few students need assistance following initial instructions.

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SEQ Item #12 - Students in the Experimental group specified sixteen occupations in which they were interested, but which were missing from the SIGI program.

SEQ Item #14 - Students who used SIGI gave it high ratings in all areas but especially in General Interest, Clarity of Directions, Assistance in Clarification of Career Values, Understanding How Values Are Related to Career Decisions, Identifying Occupations that Fit Certain Values, and Providing Information about Occupations. The lowest rating given was in the area of planning an appropriate program of study for the occupations under consideration.

SEQ Item #15 - Seventy percent of the Experimental group felt the time they spent with a Career Guidance counselor was of more value because of their experience with SIGI.

SEQ Item #16 - Ninety-two percent of the students who used SIGI thought it was VERY HELPFUL. Eight percent did not find it very helpful.

IV. CONCLUSIONS AND RECOMMENDATIONS

The purpose of a Pilot Study in the Research Design is to provide a basis for a refinement of the procedures for the more comprehensive research. Findings based upon the experience of the limited number of participants in the Pilot Study may give an indication of trends but should not be used to make major decisions, such as whether SIGI is indeed better than traditional vocational testing and counseling, or whether SIGI should or should not be retained in a community college career guidance program.

It is impossible to judge the true and full value of SIGI in a limited period of time. Only as the years pass will the persons who have used SIGI be able to look back and pass judgment on whether SIGI was useful in helping them to make wise career decisions. The authors of the SIGI Research Design believe the Pilot Study was indeed helpful, however, and from it offer the following conclusions and recommendations.

CONCLUSIONS

1. The SIGI Research Design and methods specified for the collection of data are adequate for preliminary assessment of the effectiveness of the SIGI program.

2. The techniques now being used to announce the purpose and availability of SIGI are reaching a representative segment of the Pasadena City College student body.

3. Pasadena City College students seem to have a positive reaction to the SIGI experience.

RECOMMENDATIONS

1. The Basic SIGI Research Design should be retained for the extended research through January 1977.

2. The techniques used to collect data for the Pilot Study should be retained. The collection and tabulation of data should be an ongoing process.

3. The research sample should be reviewed periodically to determine whether it is representative of the Pasadena City College student population. If certain segments of the College population are not adequately represented, a special effort should be made to direct SIGI information to them.

4. Plans should be made now for follow-up studies of the SIGI participants.